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Physical Fitness of Children with Special Needs: Aiken Validation Game Materials

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ABSTRACT
Many physical education teachers for teachers with special needs use non-game-based learning material models in improving students' physical fitness related to health. The game is one of the important factors in physical education material to improve physical fitness related to health. The purpose of the study was to validate the game material to improve the physical fitness of children with special needs. The research method uses mixed qualitative and quantitative methods. Qualitative methods were used to draft the game material model, while the quantitative approach was used to test expert agreement. The research subjects were documents and seven experts. Data were collected using the Delphi technique and were analyzed using the Aiken formula. The results show that all aspects of the running train game material model, the wood saw game material model, the tire pumping game material model, and the waving palm tree game material model are considered to have high content validity.

Keywords: *Physical fitness, Content validation, Children with special needs*

1. INTRODUCTION

Children with disabilities are engaged in less physical activity than their peers [1], [2]. Performing regular physical activity will benefit bone health [3], [4], improve psychological health [5], [6], improve body composition [7], fitness, and promote social engagement [8] for children, including children with disabilities. There is an added therapeutic benefit to doing routine activities for children with disabilities [9]. Children with disabilities often experience delays in gross motor development, less skill in balance, coordination, and poor cardiovascular fitness compared to their peers [10]. Lower participation reflects additional barriers faced by persons with disabilities, including physical, personal, social, and the environment [11], [12]. All children with special needs have the potential to be improved by participating in physical activity. The conceptual model of Physical Activity for Persons with Disabilities can help improve social relationships and personal roles with their environment and health. Barriers to physical activity have been studied more comprehensively to participation, including the lack of knowledge, skills, child preferences, fears, parental behavior, negative attitudes towards disability, inadequate facilities, the lack of transportation, lack of program and staff capacity, and cost [13].

Increasing physical fitness related to health is one of the important factors that must be done at all ages because this can be beneficial for the prevention and reduction of the risk of degenerative diseases [14], [15]. These benefits are evident if health-related fitness is fostered from school-age [16]. Health-related physical fitness consists of cardiorespiratory fitness, namely the ability to perform with the whole body for long periods of time; flexibility, or range of motion of a joint or group of joints; muscle strength, which indicates the maximum amount of force that the muscle can exert against any resistance in a short period of time; and muscular endurance, describing the ability of a muscle to sustain multiple contractions over a long period of time [17]. The results show that the value of physical fitness related to adolescent health can improve cardiovascular function [18], movement skills [19], or can reduce obesity [20], [21]. One way to improve physical fitness related to health by building active habits from an early age is the main strategy for developing health-related physical fitness, not only in the short term but also over time. Active habits in children aged four years to adulthood have been researched. The results show a positive relationship between physical activity and health-related physical fitness [22], [23], [24], [25], [26], [27]. Therefore, physical education (PE), especially when planned successfully, provides more opportunities for everyone to be active compared to

out-of-school sports facilities, which has another potential limitation [28]. The exact benefits of physical fitness on health-related fitness are demonstrated in the large literature, which outlines the effects of physical exercise on increasing physical fitness [29], or improving mental health [30]. However, the positive influence of Physical Education on health is mediated by several factors, including the style of the teacher and the choice of learning materials. In fact, the approach of teachers and teachers of children with special needs still uses the traditional approach to Physical Education, teachers of children with special needs tend to use a strict exercise routine strategy, has been associated with a lower perceived quality of life, as well as less happy children [31]. There is evidence that traditional instructional styles, less or not game-based, while most teachers still use traditional teaching styles, lead to lower, zero, or negative physical education effects on health-related fitness-related variables [32], [33], [34]. In contrast, the successful PE model seems to rely on a more game-based approach, as several authors have pointed out in previous work. For example, Dominguez and del Campo [35] compared the Sports Education model to the traditional Physical Education model, emphasizing the importance of experimenting with repetition to internalize learning in this setting. Physical fitness is the main focus of the work of Lavrin et al. [36], which distinguishes game-based programs from traditional ones. At the end of the implementation semester, students in the game-based program showed higher fitness than their traditional group counterparts. This finding was confirmed by Ceballos Gurrola et al. [37], who conducted a ball game program with elementary school children, in which it obtained a significant improvement in the metabolic profile of students in the experimental group compared to those in the control group. Based on the facts above, it is clear that the game is one of the important factors in physical education material to improve physical fitness related to health [38]. Therefore, this study aimed to validate the game material to improve physical fitness related to the health of children with special needs in elementary school.

2. METHODS

The study used a mixture of qualitative and quantitative methods. The research subjects were documents and seven experts. This research procedure consists of two steps: the first step is using a literature review approach to drafting game material for the physical fitness of children with special needs—data collection was using Mendeley to collect data on textbooks and journals from the Pubmed and Google Scholar databases. Then, the researchers identified the articles based on the research topic, namely: game material for the physical fitness of children with special needs. After identifying the articles, then the next steps were filtering the articles and choosing appropriate articles, with the aforementioned criteria in 2010 and those relevant to the topic. Data analysis was done using a qualitative thematic approach.

The second step is to use an evaluation research design. The data collection technique uses the Delphi technique [39]. Data analysis was conducted using the Aiken formula [40], elaborated as follows.

$$V = S / [n(c-1) \quad (1)$$

Information:
V = Aiken validity coefficient value,
S = rating scale value minus 1,
n = number of assessors or experts used in validation,
c = highest score in the rating scale.

3. RESULTS

Based on the thematic analysis, four game media products were produced as physical education learning materials for physical fitness for children with special needs, as follows: (1) a draft of a running train game model, (2) a draft of wood saw game model, (3) a draft of a tire pumping game model, and (4) the draft model of the waving palm tree game.

Indicators used by Experts in assessing the instruments on the draft model of the running train game material, the draft of the wood saw game material model, the tire pumping game material model draft, the waving palm tree game material model draft, are as follows: (1) suitability of the game material with learning objectives, (2) suitability of game material with basic competencies, (3) clarity of game rules, (4) clarity of language and images. The results of the assessment were analyzed using the Aiken formula, which results on the data presented in Table 1, Table 2, Table 3, and Table 4.

Based on Table 1, on aspect 1, the suitability of game material with learning objectives shows the Aiken's V coefficient value of 0.90, aspect 2 of the suitability of game material with Basic Competence shows Aiken's V coefficient value of 0.86, aspect 3 clarity of game rules shows Aiken's coefficient value V of 0.90, aspect 4 of language clarity and pictures shows Aiken's V coefficient value of 0.80. Aiken's V coefficient value ranges from 0 – 1. Because the minimum standard Aiken's V coefficient value for this research is 0.76, it can be said that all aspects show high content validity. In other words, all experts have high agreement on all aspects assessed.

Table 1. Train Running Game Material Model

Evaluator	Aspect 1		Aspect 2		Aspect 3		Aspect 4	
	Score	*s*	*Score*	*s*	*Score*	*s*	*Score*	*S*
1	4	3	4	3	4	3	4	3
2	4	3	3	2	3	2	3	2
3	3	2	3	2	4	3	4	3
4	4	3	4	3	4	3	3	2
5	4	3	4	3	4	3	4	3
6	3	2	3	2	3	2	3	2
7	4	3	4	3	4	3	3	2
s		**19**		**18**		**19**		**17**
V		**0.90**		**0.86**		**0.90**		**0.80**

Table 2. Woodsaw Game Material Model

Evaluator	Aspect 1		Aspect 2		Aspect 3		Aspect 4	
	Score	*s*	*Score*	*s*	*Score*	*s*	*Score*	*S*
1	4	3	4	3	4	3	3	2
2	4	3	3	2	3	2	4	3
3	3	2	3	2	4	3	4	3
4	4	3	4	3	4	3	3	2
5	3	3	3	2	4	3	3	2
6	3	2	3	2	3	2	4	3
7	4	3	4	3	4	3	3	2
s		**18**		**17**		**19**		**17**
V		**0.86**		**0.80**		**0.90**		**0.80**

Based on Table 2, aspect 1 of the suitability of game material with learning objectives shows the Aiken's V coefficient value of 0.86, aspect 2 of the suitability of game material with Basic Competence shows Aiken's V coefficient value of 0.80, aspect 3 clarity of game rules shows Aiken's coefficient value V of 0.90, and aspect 4 of language clarity and pictures shows Aiken's V coefficient value of 0.80. Aiken's V coefficient value ranges from 0 – 1. Because the minimum standard Aiken's V coefficient value for this study is 0.76, it can be said that all aspects show high content validity. In other words, all experts have high agreement on all aspects assessed.

Table 3. Game Material Models for Pumping Tires

Evaluator	Aspect 1		Aspect 2		Aspect 3		Aspect 4	
	Score	*s*	*Score*	*s*	*Score*	*s*	*Score*	*S*
1	4	3	4	3	3	2	4	3
2	3	3	3	2	3	2	4	3
3	3	2	3	2	4	3	4	3
4	4	3	3	2	3	2	3	2
5	3	2	3	2	4	3	4	3
6	3	2	3	2	3	2	3	2
7	4	3	4	3	3	2	3	2
s		**17**		**16**		**16**		**18**
V		**0.80**		**0.76**		**0.76**		**0.86**

Based on Table 3, on aspect 1 the suitability of game material with learning objectives shows the Aiken's V coefficient value of 0.80, aspect 2 of the suitability of game material with Basic Competence shows Aiken's V coefficient value of 0.76, aspect 3 clarity of game rules, shows Aiken's coefficient value V of 0.76, and aspect 4 of language clarity and pictures shows Aiken's V coefficient value of 0.86. Aiken's V coefficient value ranges from 0 – 1. Because the minimum standard Aiken's V coefficient value for this research is 0.76, it can be said that all aspects show high content validity. In other words, all experts have high agreement on all aspects assessed.

Table 4. Material Model for the Waving Palms Game

Evaluator	Aspect 1		Aspect 2		Aspect 3		Aspect 4	
	Score	*s*	*Score*	*s*	*Score*	*s*	*Score*	*S*
1	3	2	4	3	4	3	4	3
2	3	2	3	2	3	2	4	3
3	3	2	3	2	3	2	4	3
4	4	3	4	3	4	3	3	2
5	4	3	4	3	3	2	4	3
6	3	2	3	2	3	2	3	2
7	3	2	4	3	4	3	3	2
s		**16**		**18**		**17**		**18**
V		**0.76**		**0.86**		**0.80**		**0.86**

Based on Table 4, aspect 1 of the suitability of game material with learning objectives shows the Aiken's V coefficient value of 0.76, aspect 2 of the suitability of game material with Basic Competence shows Aiken's V coefficient value of 0.86, aspect 3 clarity of game rules shows Aiken's coefficient value V of 0.80, and aspect 4 of language clarity and pictures shows Aiken's V coefficient value of 0.86. Aiken's V coefficient value ranges from 0 – 1. Because the minimum standard Aiken's V coefficient value for this research is 0.76, it can be said that all aspects show high content validity. In other words, all experts have high agreement on all aspects assessed.

4. CONCLUSION

Based on the results and discussion of the research, it is concluded that the running train game material model, the wood saw game material model, the tire pumping game material model, and the waving palm tree game material model have high content validity to be used as physical education learning in improving physical fitness for children with special needs. Physical education teachers can use this material model in an effort to improve the physical fitness of children with special needs. In addition, this material model needs to be continued with research to find out the effectiveness of this material model to improve physical fitness.

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